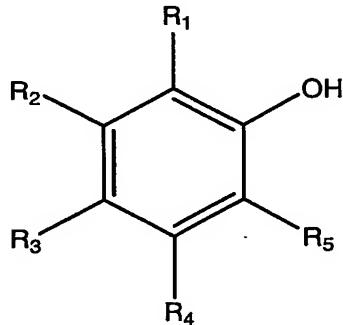
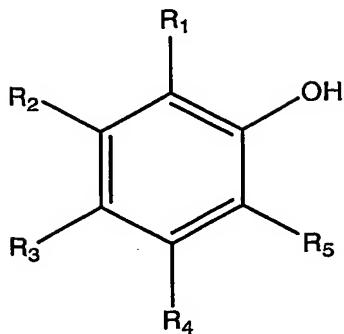


**WHAT IS CLAIMED IS:**

1. A pipe capable of obtaining an F time in Jana Laboratories Procedure APTF-2 of at least 1000 hours, under the following conditions pH 6.8 ( $\pm 0.1$ ); Chlorine 4.1 mg/L ( $\pm 0.1$ ); Nominal ORP 830mV; fluid temperature 110°C ( $\pm 1$ ); air temperature 110°C ( $\pm 1$ ); pressure 70 psig ( $\pm 1$ ); flow rate 0.1 US gallons/min ( $\pm 10$  percent); said pipe comprising polyethylene having a density greater than about 0.925 g/cc.
2. The pipe of Claim 1 wherein pipe comprises an antioxidant system comprising two or more components.
- 10 3. The pipe of Claim 2 wherein one of the antioxidant system components provides extraction resistance and another provides oxidation resistance.
4. The pipe of Claim 3 wherein the antioxidant system includes at least one antioxidant from each of
  - a) a first class of antioxidants comprising a hindered phenols corresponding to  
15 the formula:



wherein R<sub>1</sub> and R<sub>5</sub> can independently be -CH<sub>3</sub>, -CH(CH<sub>3</sub>)<sub>2</sub>, or -C(CH<sub>3</sub>)<sub>3</sub>, and R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> can independently be any hydrocarbon or substituted hydrocarbon group; and wherein the antioxidant from the first class is characterized as being more than five percent soluble in a hexane solution at 20°C, and further characterized by having its hydrolyzed product being more than five percent soluble in a hexane solution at 20°C; and  
20 b) a second class of antioxidants comprising a hindered phenols corresponding to the formula:



wherein R<sub>1</sub> and R<sub>5</sub> can be -CH<sub>3</sub>, -CH(CH<sub>3</sub>)<sub>2</sub>, or -C(CH<sub>3</sub>)<sub>3</sub>, and R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> can independently be any hydrocarbon or substituted hydrocarbon group provided that R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are chosen such that the antioxidant does not contain the moiety Ph-CHR<sub>6</sub>-Ph, where 5 Ph represents a phenyl ring and R<sub>6</sub> can be H or a phenyl ring.

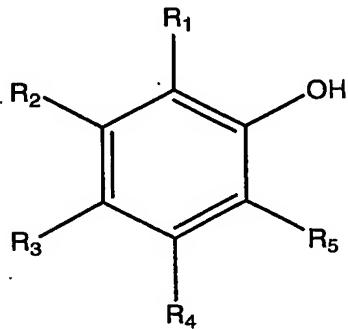
5. The pipe of Claim 4 wherein two or more antioxidants are selected from the group consisting of Irganox 1010; Irganox 1330; and Irganox 1076

6. The pipe of Claim 4 wherein the antioxidant system further comprises Irgafos 168.

10 7. A pipe comprising reactor grade polyethylene having a density greater than about 0.925 g/cc capable of obtaining an F time in Jana Laboratories Procedure APTF-2 of at least 1200 hours.

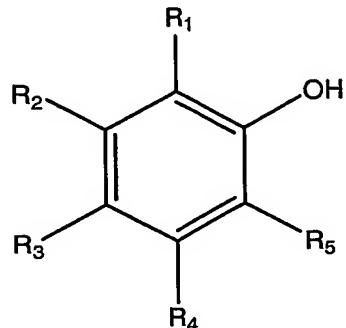
8. The pipe of claim 7 wherein the pipe further comprises at least one antioxidant from each of

15 a) a first class of antioxidants comprising a hindered phenols corresponding to the formula:



wherein R<sub>1</sub> and R<sub>5</sub> can independently be -CH<sub>3</sub>, -CH(CH<sub>3</sub>)<sub>2</sub>, or -C(CH<sub>3</sub>)<sub>3</sub>, and R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> can independently be any hydrocarbon or substituted hydrocarbon group; and 20 wherein the antioxidant from the first class is characterized as being more than five percent soluble in a hexane solution at 20°C, and further characterized by having its hydrolyzed product being more than five percent soluble in a hexane solution at 20°C; and

b) a second class of antioxidants comprising a hindered phenols corresponding to the formula:



wherein R<sub>1</sub> and R<sub>5</sub> can be -CH<sub>3</sub>, -CH(CH<sub>3</sub>)<sub>2</sub>, or -C(CH<sub>3</sub>)<sub>3</sub>, and R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> can independently be any hydrocarbon or substituted hydrocarbon group provided that R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are chosen such that the antioxidant does not contain the moiety Ph-CHR<sub>6</sub>-Ph, where Ph represents a phenyl ring and R<sub>6</sub> can be H or a phenyl ring.

- 5        9. The pipe of Claim 8 wherein the polyethylene is multimodal.
- 10      10. The pipe of Claim 8 wherein the density is greater than 0.940
11. The pipe of Claim 8 wherein the polyethylene resin further comprises one or more metal deactivators.
12. The pipe of Claim 8 wherein the polyethylene resin further comprises one or more phosphorous based stabilizer.
13. The use of a pipe as in Claim 8 for chlorinated hot water.
- 15      14. The pipe of Claim 1 in which the F time is greater than 1200 hours.